

The feed zone - Basic eating for basic training

By Monique Ryan, MS, RD

This report filed February 16, 2005

Many cyclists are currently building their aerobic endurance, muscular strength, and flexibility in anticipation of more specific training in the coming weeks and months. Just as this training cycle requires you follow a specific mix of volume and intensity, your nutritional intake must match up so that you have the required energy and fluids at the most optimal times for your training and recovery.

As you continue to build your volume, your energy and carbohydrate requirements increase. During this base cycle, you may also be interested in losing weight. This is a good time of year to adopt nutritional habits that result in gradual weight loss so that you do not have to restrict calories when training really picks up in intensity. For each training cycle, you need to consider your nutritional requirements for energy, carbohydrate, protein, fat, and fluid strategies.

Energy

While estimating energy needs is both a science and an art, a few generalizations can be made to assist you in determining your energy needs. If you want to lose weight, a mild restriction is 300 calories daily for a weight loss of approximately half-a-pound weekly, and 500 calories for one pound weight loss weekly. Greater calorie restrictions can produce more weight loss, but could also compromise your energy levels and recovery.

Obviously within this current training cycle you can experience various types of workouts during the week and weekends. Energy requirements for maintenance can be based on training time:

12-14 calories per pound: Mild activity with no purposeful training or exercise (day off)

15-17 calories per pound: One hour training at moderate intensity

18-24 calories per pound: One to two hours at moderate intensity

25-30 calories per pound: Several hours of training daily

Carbohydrate

Carbohydrate of course along with fat is a steady fuel supply during any type of low to moderate intensity training. Carbohydrate needs need to match training in order to replace the muscle glycogen that you burn for fuel.

2.25-3.0 grams/lb.: Moderate intensity training for one hour or very low intensity for several hours

3.0-4.5 grams/lb.: Greater than 90 minutes daily at moderate intensity. Consume from the high end of the range for several hours of moderate intensity.

These carbohydrate requirements include both the types of carbohydrates found in sports drinks and gels and consumed during training, as well as the whole grains, fruits, and vegetables that make-up a balanced training diet. Timing your carbohydrate intake properly also supports your training efforts. In the two hours before longer training sessions consume up to 50-75 grams of carbohydrate. Pay attention to recovery nutrition and consume 0.5 g/lb. carbohydrate after longer training sessions. You can also add in 10-15 g of protein to your recovery snack. You can consume the same nutritional amounts again in 2 hours after longer training sessions.

Protein

Your protein requirements are a reflection of the increased volume of training and

your efforts to build muscular endurance. Aim for 0.5 to 0.7 grams/lb. weight- an amount easily obtained in a well-balanced diet.

Fat

Healthy fats should round out your calories at no more than 0.5 grams/lb. body weight.

Fluid

Meeting your fluid requirements during training is important. While sweat losses may not be as striking as in the warmer months, even a small amount of dehydration can have a negative impact upon your performance. Maintain daily hydration. Your urine should be pale yellow in color if you are adequately hydrated. Urine is more concentrated and darker in the morning, and can be darker if you take a multivitamin/mineral supplement.

Estimating your sweat losses during this early-season cycle is still important. You can determine how your sweat rate may vary for different workouts, whether indoors or outdoors. (see "[The feed zone - Nutrition Q&A with Monique Ryan - Salt of the Earth](#)") Practice drinking during training to match your sweat losses. If you are losing more than 2 lb. during a specific training session, you are experiencing significant dehydration during training. Your fluid losses can still be significant during cold weather rides.

You can also pre-hydrate with up to 20 ounces of fluid in the two hours before training and top it off with 8-10 ounces of fluid in the 20 minutes before training. A sports drink can be consumed immediately before and during exercise. During steady training lasting longer than 90 minutes consume 4 to 8 ounces of sports drink every 15 to 20 minutes (or try to match sweat losses as closely as possible) to maintain hydration. You can consider using a sports drink during shorter duration workouts if it improves the amount of fluid that you consume (due to the flavor) and you have not consumed any fuel in the two hours prior to training. After training rehydrate- consuming 20-24 ounces of fluid per pound of weight loss should restore fluid levels.

<p style="text-align: center;">Sample menu for cyclist 90 minute indoor cycle at 6:00 p.m. 165 lb. male 3300 calories, 500 g carbohydrate (61%), 115 g protein (14%), 92 g fat (25%)</p>
<p>Breakfast (7:00 am) Oatmeal, cooked, 1 cup Raisins, 2 Tbsp. Dairy or soy milk, 8 ounces Banana, 1 small Juice, 12 ounces</p>
<p>Snack (10:00 am) Yogurt, 6 ounces Apple, 1 medium Almonds, 12</p>
<p>Lunch (1:00 pm) Turkey, 4 ounces</p>

Bread, whole grain, 2 slices
Avocado, 2 slices
Orange, 1 medium
Bean and rice mix, 1 cup
Raw vegetables, 1 cup

Snack (3:00 pm)

Crackers, whole grain, 10
Hummus, 4 tbsp.
Pear, 1 large

Bike training- 90 minutes at moderate intensity (6:00 pm)

Sports drink, 24 ounces per hour Total of 36 ounces

Dinner (8:00 pm)

Fish, 4 ounces
Sweet potato, 1 large
Broccoli, steamed, 1 cup
Salad, 2 cups
Salad dressing, light, 4 tbsp.

Snack (9:30 pm)

Yogurt, frozen, low fat, 2/3 cup
Frozen berries, 1 cup

The feed zone - Nutrition Q&A with Monique Ryan - Salt of the Earth

By Monique Ryan, MS, RD

This report filed June 30, 2004

As mentioned in the nutrition column for [June 10th](#), the Institute of Medicine (IOM) and National Academy of Sciences recently made recommendations for sodium intake that are targeted primarily for sedentary Americans. In this column we will take a look at a few key points regarding sodium and sodium sweat losses as it relates to endurance athletes.

The IOM has recommended that sodium intake be at 1500 milligrams daily. This recommendation is based on the fact that research supports that reduced intake of sodium coupled with increased potassium intake can help prevent the increase in blood pressure that occurs with aging.

First it is important to appreciate that the daily sodium requirements of athletes can vary widely due to sweat losses of sodium. Daily sodium losses in your urine are small- about 25 milligrams per day, and 100 mg from your skin. However, sodium sweat losses can vary greatly and be significant during hard and long training sessions outdoors. Athletes have had measured sodium sweat losses ranging from 460 to 1800 mg sodium per liter sweat. How much sodium you lose in an hour of training is also a product of your sweat rate. Some well-acclimated triathletes and cyclists may be very efficient sweaters and lose only one-half to one liter of sweat per hour, while others may reach higher levels of two or three liters per hour in hot and humid weather, despite being acclimated.

Clearly, endurance athletes need more sodium in their diet because they lose more sodium in their sweat. Sweat contains more salt when you are starting to become acclimatized, and should decrease as you spend more time training and racing in the heat. Depending on your sodium losses, which vary with your

individual sodium sweat losses and the amount of hours spent training, you can replace your sodium sweat losses with the salt or sodium in your daily diet and by consuming a sports drink with adequate sodium.

For example, let say that you sweat about 1.5 liters per hour. In a well-acclimated athlete your sodium losses per liter may be about 750 mg. So in one hour you lose 1125 mg of sodium. If you train for three hours, your total sodium sweat losses are 3375 mg of sodium. Clearly the days that you put even more hours of training will increase your total sodium sweat losses further. Having some salty foods and salting your food replaces some of the sodium lost in sweat.

Besides having enough sodium in your diet, you can also consume a sports drink that contains adequate sodium. Check the sodium content of your favorite carbohydrate-electrolyte beverage. Pay attention to how many ounces you consume per hour and estimate your sodium intake per hour. You do not need to replace all of your sodium losses, but simply need to consume enough sodium to prevent sodium levels from dropping too low.

Besides focusing on your sodium intake during training, monitor your hydration status after different training sessions that vary in training time and intensity. Check your weight before and after training sessions to measure how effectively you are able to keep up with ? or possibly exceed ? your sweat losses. A weight loss of two to five pounds over the course of a workout can indicate that you might need to increase your fluid intake. Conversely, if you actually gain weight during training, your drinking may be excessive. It is important to optimize your hydration, and sodium intake, not maximize your intake beyond your fluid and sodium losses.

Monique

The feed zone - Basic eating for basic training Part II

Focus on Quality and Choices

By Monique Ryan, MS, RD

This report filed March 2, 2005

As you continue your basic training and prepare for the coming race season, you appreciate the importance of matching training with the proper amounts of energy, carbohydrate, protein and fats (See "[The Feed Zone: February 16th](#)"). During this training cycle, you can also focus on types of food choices you consume to provide quality nutrition and variety to your daily and training diet.

Daily Diet

This is one of the best times of the year to experiment with new foods and recipes. While you can still keep convenience and time in mind (what's good, quick, and easy?), don't keep falling into the same old food choices and meals. Variety in foods also provides a variety of nutrients, keeping your diet balanced and interesting.

Focus on maintaining a strong immune system. Training stresses your body, and taking a few days or a week off from training due to an illness, could hold back your training efforts. Focus on quality carbohydrates provided from whole grains, fruits, and vegetables.

Grains and more

Tired of the same repetitive rice, potatoes and pasta? Even if you aren't, experiment with some whole grains. Many of these foods can be prepared in less than 15 to 20 minutes, and cooking them can easily become part of your weekly routine. Some good whole grain choices include kasha or buckwheat, which is a

great source of fiber and magnesium. Barley is an ancient and nutritious high fiber whole grain. Pearl barley has had the outer husk removed, but is still high in soluble fiber (that kind that lowers cholesterol) and can be prepared in 10 minutes. [Quinoa](#) has also been around for thousands of years and is common in South American cuisines. It is higher in protein than most grains, and a great source of copper, iron, and magnesium. Of course brown rice (prepare ahead of time if necessary) is more nutritious than white rice, and whole meal pasta is also a better choice than more refined varieties. Other whole grains include [amaranth](#), bulgur, millet, steel-cut oats, [teff](#), and wheat berries. Other highly nutritious carbohydrate choices include sweet potatoes, and all varieties of the in-season winter squash. Dried beans and lentils are also highly nutritious and great source of carbohydrates, a good source of protein, and high in fiber, calcium, and B vitamins.

Fruits and Vegetables

The sixth edition of the Dietary Guidelines for Americans just released by the USDA this past January now call for nine servings of fruits and vegetables daily for a hefty dose of vitamins, minerals, and phytochemicals. Add variety to your current winter fruit and vegetable intake and build on your choices as we move into the spring season and welcome wider produce choices. Green leafy vegetables such as kale, collard greens, and broccoli are highly nutritious and can be steamed or stir-fried. Any fruits or vegetables with a deep orange color like carrots are also filled with nutrients. Fresh fruits make great snacks and frozen fruits (no sugar added) can be used in skim milk and soy milk smoothies. Try to include vegetable choices at both lunch and dinner, and even with snacks. Filling-up on fruits and vegetables also supports any weight loss goals you may have early in the season. Many studies also indicate that consuming plenty of fresh fruits and vegetables reduces risk of stroke, type 2 diabetes, and certain cancers.

Training Diet

This is also a great time of year to experiment with new sports nutrition products, including those you carry during a race, and specific brands that are provided on the race course. Having a sports drink that you like, tolerate, and drink enough of during training and racing is essential for a successful race season. You can also check your any weight loss before and after training to see how closely your fluid intake matches sweat losses. Reassess your fluid needs as the season progresses and the weather turns warmer.

In addition to fine-tuning your sports drink choices and drinking strategies, you can also experiment with gels and energy bars. Most athletes need 40 to 60 grams of carbohydrate per hour during training, though long races and ultraendurance events can push up these needs to over 100 g per hour. This is a good time to experiment with consuming and tolerating those higher carbohydrate amounts.

As your training builds, continue to place close attention to your *immediate* recovery nutrition needs. This starts the recovery process until the next training session, which can take place in 12 hours (or less), or 24 hours. Aim for 0.7 g carbohydrate per pound weight (1.5 g/kg), or 88 g for a 120 lb. athlete, or 115 g for a 165 lb. athlete, when glycogen resynthesis occurs at an accelerated rate. You can also add in some protein to the mix, at about 10 to 15 g. But consuming adequate carbohydrate is your priority. Some recovery sports nutrition products are convenient, but you can also make recovery smoothies and snacks. For a high glycemic carbohydrate choice, which has some recovery advantages over lower glycemic choices, try a bagel with peanut butter and fruit. Energy bars are

also quick and effective when eating on the run after training. Of course when consuming solid foods after training, you should also focus on rehydration efforts.

Nutrition advice for athletes: Keeping your immune system strong for winter training

By Monique Ryan, MS, RD

This report filed February 2, 2005

Cold and flu season are still lingering and with your training program switching into higher gear for the 2005 racing season, nutrition strategies for staying healthy remain a top priority. You don't want a viral infection to slow down your workouts and hamper your fitness, so that you can be race ready for this season. This column focuses on some nutritional strategies that you can practice in both your daily diet and nutrient supplementation, and specifically around training sessions in order to give your immune system a good boost.

From a nutritional perspective, it is key to prevent deficiencies and consume optimal amounts of nutrients that play an essential in maintaining a healthy immune system. Periods of heavy training are also associated with a depressed immune function and compromised immune function can be further aggravated by inadequate nutrition. The body's susceptibility to a respiratory infection can be elevated for 24 hours after a tough workout, and a demanding race can impair your immune function for one to two weeks. Combining training with school and/or work can overtax an endurance athlete's resources, stress your body and compromise your ability to fight infection. You are also likely to be exposed to individuals with a cold or the flu over the next few months. A strong immune system should result in fewer colds or viruses, and if you do get sick, recovery should be quicker.

Your Daily Diet and Supplementation

Because increased oxygen utilization during exercise can increase the production of free radicals (unstable molecules that can cause tissue damage at the cellular level), increased food intake and supplementation with antioxidants may enhance immune-system performance. One of the nutrients most commonly associated with preventing colds is vitamin C, which has a widespread reputation as an immune system booster. While a multivitamin mineral supplement easily provides the Daily Value of vitamin C, don't underestimate the importance of consuming good food sources of this vitamin. Endurance athletes can consume over three servings of fresh fruit daily and up to two cups of cooked vegetables daily for ample amounts of dietary vitamin C. Most research measuring the effects of high doses of vitamin C through supplementation have not shown additional protection to the immune system, though many athletes swear by their vitamin C supplements. What we do know is that a daily dose of 250 mg is adequate to your saturate body stores with vitamin C. Excellent sources of vitamin C include sweet peppers, citrus fruits and juices, strawberries, cantaloupe, kiwi fruit and broccoli.

Two South African studies have produced encouraging results regarding vitamin C supplementation. One study had athletes supplement 600 milligrams of vitamin C for three weeks before a 90 km ultramarathon. The supplemented runners experienced fewer upper-respiratory infections in the two weeks following the race. A following up study confirmed these results, though a recent study is not as encouraging. Athletes supplemented with 1500 milligrams of vitamin C for seven days before a 90 km ultramarathon did not demonstrate enhanced immune function or decreased oxidative stress. While there is limited data on the adverse affects of high levels of vitamin C supplementation, doses in excess of 1000 milligrams could result in some gastrointestinal side effects.

Regardless of your level of supplementation, sticking with a high intake of fruits and vegetables should pay off immune wise. They contain hundreds of phytochemicals that provide many preventative health benefits, and are also excellent sources of carotenoids that boost the activity of white blood cells called lymphocytes. Beta-carotene can also be converted to vitamin A in your body, an important nutrient for the immune system.

Other nutrients essential for a strong immune system include adequate intakes of zinc, iron, and vitamins B6 and B12. A good daily multivitamin and mineral supplement providing 100-percent of the Daily Values ensures adequate intake of these nutrients on top of a well-balanced diet. Megadosing with vitamins and minerals can often compromise the immune system, especially with excessive intakes of iron, is not advised as this could impair immune function and increase susceptibility to infection. While iron is an important mineral for endurance athletes, iron supplements should be taken as required with regular monitoring or iron status. Excess iron can increase inflammation in the body. Research on zinc supplementation and the common cold is split down the middle in regards to effectiveness. While there is limited evidence that zinc supplementation can reduce the severity or duration of a cold, it appears that zinc must be taken within 24 hours of the onset of symptoms to provide any benefit.

Vitamin E is also a popular antioxidant nutrient, but one recently published study has suggested that large supplemented doses may produce negative effects in athletes. Triathletes took an 800 IU dose of vitamin E for two months before competing in an Ironman. When compared to a placebo, the vitamin-E supplemented group experienced more oxidative stress and a greater inflammatory response. It is important to keep in mind that very high doses of antioxidants can produce a harmful pro-oxidant effect and potentially impair your body's immune-system response. Right now many experts consider a dose of 200 IU to be safe. Strict dieting and chronic inadequate calorie intake can also compromise your immune system.

Calorie balance and essential fatty acids

Rapid weight loss of greater than 2 pounds per week (an amount often recommended by many diet programs) can have negative immune effects. Consuming adequate calories is of course also beneficial for an athlete's recovery and energy levels. Poorly planned and low calorie diets can also be low in protein, which also compromises your immune system. Diets too low in energy can also result in inadequate intake of immune boosting vitamins and minerals.

Having the proper balance of fat in your diet, and choosing good fats can also give your immune system a boost. While a very high fat diet can compromise immune function, a very low fat diet does not provide adequate amounts of essential fat acids. Polyunsaturated oils that provide omega-6 and omega-3 fatty acids are good for the immune system. However, most North Americans consume enough of the omega-6 fats (if not an excess) and need to increase intake of the omega-3s. Walnuts, fatty fish, and flax, soy and canola oils are good sources of this healthy fat.

Nutritional strategies around training

Besides consuming a healthy diet and supplementing wisely, specific nutrition strategies around training are also beneficial. When your immune system is compromised from training, this effect is related to elevated concentrations of stress hormones. Nutritional strategies to boost the immune system around training sessions focused on reducing the stress hormone response, less disturbance in blood immune cell counts, and lower oxidative activity. Some of the most important nutritional strategies center around carbohydrate intake before, during, and after training- a familiar practice for endurance athletes.

So training with optimal stores of carbohydrate not only provide fuel for your workouts, but supports a strong immune system. Endurance athletes who train in the carbohydrate depleted state experience greater increases in the stress hormones that increase during exercise. Consuming carbohydrate before, during, and after endurance exercise seems to diminish some of the immunosuppressive effects of intense training. Carbohydrate intake before, during, and after training results in lower cortisol levels, fewer changes in blood immune cell counts, lower oxidative activity, and a diminished inflammatory response.

Overall, good dietary carbohydrate replacement in your daily diet that matches your training session (based on intensity and volume) supports your immune system. When you train for longer periods, the carbohydrate that you consume (usually in the form of a sports drink), also decreases some of the immunosuppressive effects of endurance training. After hard training, give your fuel stores a nutritional boost by consuming 50 to 75 g of carbohydrate afterwards, along with 10-15 g of quality protein to start the recovery process. This is especially important, as there is a window of at least several hours of depressed immune function after hard exercise. Try to stay away from individuals who have colds after hard training.

Of course managing life stress, getting adequate amounts of sleep also support a healthy immune system.
